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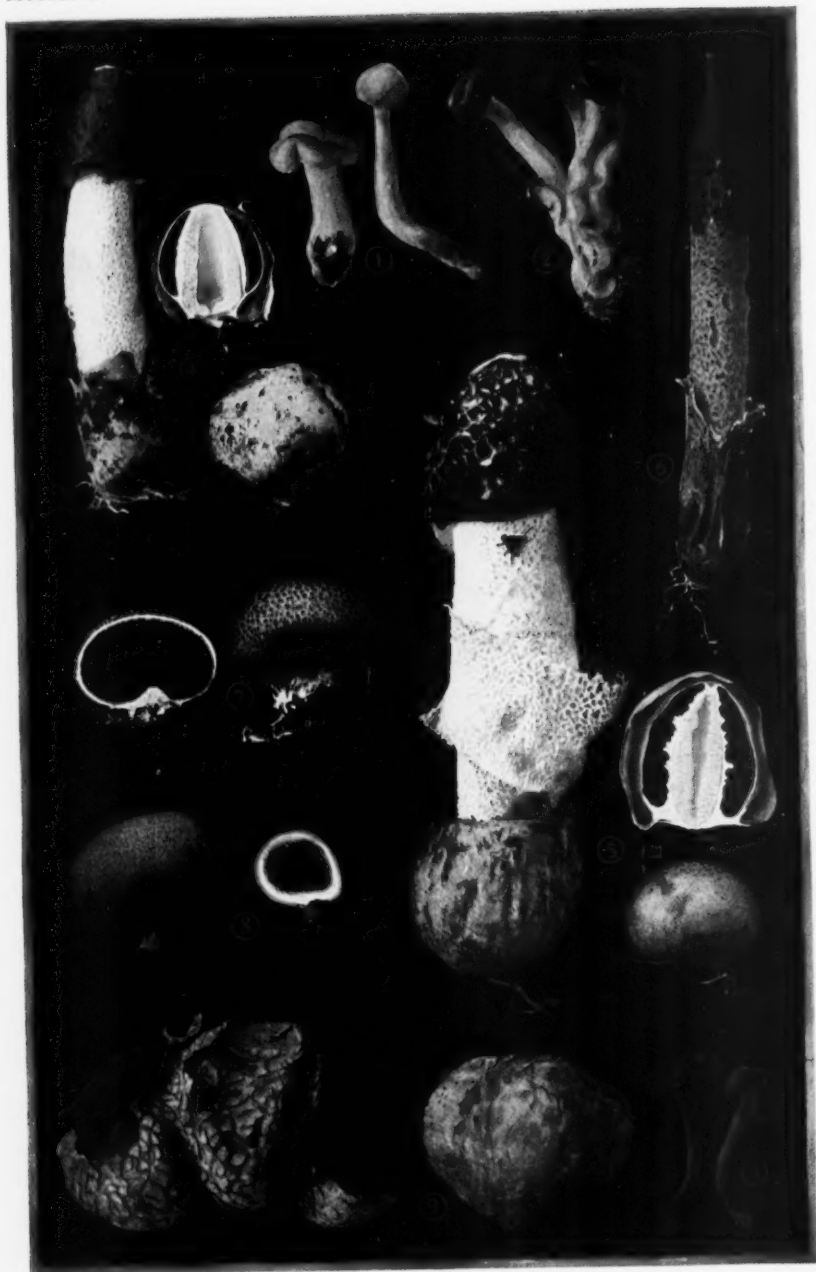
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ILLUSTRATIONS OF FUNGI

MYCOLOGIA

VOL. II

JANUARY, 1910

No. 1

ILLUSTRATIONS OF FUNGI—V

WILLIAM A. MURRILL

Most of the species here figured belong to the Gasteromycetes. The illustrations were made from specimens collected in or near Bronx Park, New York City. The three species of *Leotia*, belonging to the Discomycetes, were found at Chappaqua, New York. The descriptions of these three species are mainly drawn from Durand's excellent monograph of the Geoglossaceae of North America.

Leotia lubrica (Scop.) Pers.

YELLOW LEOTIA

Plate 17. Figure 1, $\times 1$

Plants usually densely clustered, more or less viscid-gelatinous, ochraceous-yellow, often with a greenish or olive tint, especially with age or on partial drying, 3-6 cm. or more high; ascigerous portion pileate, convex above, the surface often irregularly furrowed, with a recurved margin, wrinkled or nodulose, 1-1.5 cm. broad: stem terete or somewhat compressed, usually slightly tapering upward, the adjacent ones often coalescing below, about 1 cm. thick below, 0.5 cm. thick above, minutely squamulose, sometimes with innate greenish granules; asci narrowly clavate, $130-160 \times 10-12 \mu$; spores 8, hyaline, smooth, subfusiform, $18-28 \times 5-6 \mu$, becoming 5-7-septate; paraphyses filiform, branched, hyaline.

This species, said to be edible, is the commonest member of the Geoglossaceae in the eastern United States, occurring on rich humus or sandy soil in woods from Ontario to Alabama and west to Iowa. It is very variable in color and consistency, being

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sensitive to differences in situation, moisture, and substratum. Several of its forms have received specific names.

***Leotia stipitata* (Bosc) Schroet.**

TWO-COLORED LEOTIA

Plate 17. Figure 2. $\times 1$

Plants solitary or clustered, viscid-gelatinous, 3-6 cm. or more high; ascigerous portion 1-2 cm. or more broad, margin incurved toward the stem, even or irregularly nodulose, hymenium deep aëruginous-green, whitish below: stem terete or slightly tapering upward, white or pale-ochroleucous, 2-4 cm. high, 0.5-1 cm. thick, often beset with minute green squamules: asci narrowly clavate-cylindrical, $118-150 \times 10 \mu$; spores 8, hyaline, smooth, becoming 5 or more septate, $16-28 \times 5-6 \mu$; paraphyses filiform, branched, the apices intensely green when fresh.

This species occurs in rich humus or soil in woods from Maine to Florida and west to California. Its colors are constant under all conditions, and it does not intergrade with other species. The dark bluish-green cap and pale-yellow or white stem form a very striking contrast and easily distinguish it from the two other species.

***Leotia chlorocephala* Schw.**

GREEN LEOTIA

Plate 17. Figure 3. $\times 1$

Plants solitary to densely clustered, subgelatinous, entirely green, 1-5 cm. high; ascigerous portion hemispherical, convex, margin incurved, obtuse, hymenium smooth or furrowed, the margin often lobed or nodulose, pea-green to aëruginous, 2-10 mm. wide; stem terete, firm, the middle layer green, surface densely squamose or furfuraceous with green granules, 1-4.5 cm. high, 2-4 mm. thick, changing little in color on drying: asci narrowly clavate, $125-150 \times 10-12 \mu$; spores 8, hyaline or faintly greenish, narrowly ellipsoid, becoming about 5-septate, $18-20 \times 5-6 \mu$; paraphyses filiform, branched, the apices green.

This plant is entirely green and opaque, with furfuraceous stem. The name assigned it by Schweinitz has caused some confusion because it applies better to *L. stipitata*, which is "green-headed." It occurs on sandy soil in rich woods or among mosses in ravines from New Hampshire to Alabama.

Dictyophora Ravenelii (Berk. & Curt.) Burt

SAWDUST STINKHORN

Plate 17. Figure 4. $\times \frac{1}{2}$

Pileus conic-campanulate, 2.5-3.5 cm. long, the surface white and granulate or minutely wrinkled after the disappearance of the olivaceous gleba; apex smooth, white, umbilicate, closed by a thin membrane or at length perforate; spores oblong-ellipsoid, $4-5 \times 2 \mu$, involved in mucus; stipe cylindric, slender, tapering at each end, cellular-spongy, white, hollow, 10-12 cm. high, 2 cm. thick; veil membranous, usually scarcely half the length of the pileus and concealed beneath it, very rarely protruding; volva ovoid, pinkish, 4-5 cm. in diameter, containing the lower half of the veil attached about the base of the stipe.

This species occurs in abundance in old sawdust piles and about rotting logs and stumps in woods and fields in the eastern United States and Canada. It may be readily distinguished from the veiled stinkhorn by the absence of a conspicuous, reticulate veil; its cap is also smooth instead of coarsely pitted, and its odor is less penetrating and disagreeable.

Dictyophora duplicata (Bosc) Ed. Fisch.

VEILED STINKHORN

Plate 17. Figure 5. $\times \frac{2}{3}$

Pileus campanulate, 5 cm. long, the surface appearing strongly reticulate-pitted after the fetid, olivaceous gleba has been devoured by flies or washed away by rains; apex truncate, perforate; spores oblong-ellipsoid, $4 \times 2 \mu$, involved in mucus at maturity; stipe fusiform-cylindric, tapering at each end, cellular-spongy, white, hollow, 10-20 cm. high, 2.5-3 cm. thick; veil white, reticulate, variable in length, sometimes much expanded, always conspicuous, fragile; volva globose, nearly white, very poisonous, 5-7 cm. in diameter.

This very conspicuous and objectionable species occurs in the United States about buildings and near stumps in fields and in the edges of woods. It may be easily recognized by its conspicuous veil, which is attached near the apex beneath the pileus and hangs down to the middle of the stipe or lower. The mature gleba is extremely fetid, proving attractive to flies, which probably disseminate the spores. *Ithyphallus impudicus* (L.) Ed.

Fisch., another very fetid stinkhorn, abundant in Europe and reported rarely in this country, has no veil of any kind, although its pileus is reticulated similarly to that of the veiled stinkhorn. Both of these species may be exterminated in lawns and groves by the use of quick-lime, as described in MYCOLOGIA for March, 1909.

Mutinus elegans (Mont.) Ed. Fisch.

HEADLESS STINKHORN

Plate 17. Figure 6. $\times \frac{1}{2}$

Stipe horn-shaped, cylindric, tapering gradually to the apex, pitted, hollow, white or pinkish below, bright-red or orange above, 10-17 cm. long, about 2 cm. thick; apex conic-acuminate, perforate; gleba greenish-brown, semifluid, fetid, smeared over the upper portion of the stipe in an indefinite manner; spores oblong-ellipsoid, $4-5 \times 2 \mu$; veil none; volva oblong-ovoid, pinkish, 2.5-3 cm. long.

This species is very conspicuous by reason of its size and brilliant coloring. It occurs rather commonly in the United States in rich cultivated grounds or woods. A smaller species, *Mutinus caninus* (Huds.) Fries, found rarely in the eastern United States and also in Europe, may be readily distinguished by its more distinct pileus and very faint odor. Both species readily lose the greenish slime containing the spores, since this is eagerly devoured by flies and easily washed away by light rains.

Scleroderma aurantium (L.) Pers.

COMMON SCLERODERMA. HARD-SKINNED PUFFBALL

Plate 17. Figure 7. $\times \frac{1}{2}$

Peridium depressed-globose, sessile, radicate, often cespitose, 2.5-8 cm. in diameter, thick, corky, usually pale with yellow shades, or orange, sometimes brown, mostly covered with large warts; gleba at first white, then vinaceous to bluish-black, finally greenish-gray, lines of trama whitish; spores dark, globose, warted, $7-12 \mu$.

A very common and widely distributed species growing in dry woods, especially under chestnut trees. I have eaten the young sporophores, but do not consider them attractive. Persons have

brought them to me thinking they were truffles. In section, and in the method of disseminating its spores, this species closely resembles the preceding one.

Scleroderma verrucosum (Bull.) Pers.

SMALL-WARTED SCLERODERMA

Plate 17. Figure 8. $\times \frac{3}{4}$

Peridium subglobose, 2.5-7 cm. in diameter, ochraceous, purplish or dingy-brown, thin and fragile above, covered with minute warts, continued below into a more or less elongated stem-like base, sometimes reaching 3 cm. or more in length, when it is usually lacunose; gleba white, then vinaceous to black, at length umbrinous, lines of trama whitish; spores globose, warted, dark, 8-13 μ .

This species is neither so common nor so well known as the following species, from which it differs in having much smaller warts. It is also usually of smaller size in this region and often more purplish or brownish in color. It occurs on sandy ground and roadsides in woods, and is of wide distribution. A section of the young sporophore shows a broad white border, with a firm, wine-colored to black interior marked with whitish lines. This mass later becomes umbrinous and powdery and escapes through the rupture of the upper portion of the peridium.

Scleroderma Geaster Fries

STELLATE SCLERODERMA

Plate 17. Figure 9. $\times \frac{1}{2}$

Peridium large, globose, sessile, often cespitose, thick, nearly smooth, yellowish-brown or greenish-brown, splitting at maturity in a stellate manner at the apex, reminding one of an earth-star; gleba umbrinous with a purple tinge, trama whitish; spores globose, coarsely warted, 12-16 μ in diameter.

This large, dull-colored species is quite abundant in the eastern United States on banks and roadsides and in short grass in thin woods. It is usually half imbedded in the earth and this fact together with its dull colors render it inconspicuous until maturity. It often much resembles a potato that has been exposed

to the light and has become somewhat greenish. The splitting of the upper portion into lobes is quite characteristic. An earth-star splits in this way more completely and regularly and has in addition an inner peridium containing the spore-mass.

A CORRECTION IN NOMENCLATURE

HOWARD J. BANKER

In the second edition of the *Species Plantarum* in 1763, Linnaeus described a fungus which he called *Hydnum parasiticum* as follows: "acaule arcuato-rugosum tomentosum. Habitat in Europae arboribus." This appears to be the original publication of the species and Linnaeus never furnished any more complete account of the plant. It seems practically impossible from so meager a characterization to identify the plant thus named. In later editions of the *Species Plantarum* the name and description are continued unchanged. In 1769, a plant was figured in *Flora Danica* pl. 465, which was supposed to be the Linnaean species. The figure, however, fails to give any more definite characters of the plant. In the same year Weigel quotes the Linnaean species and appends a more elaborate description.* The fact that he states that the plant described by him is at first gelatinous raises the question whether he really had the Linnaean plant. In 1787, Willdenow described a plant† which he doubtfully referred to *Hydnum parasiticum* L. and the next year he repudiated his determination by figuring and describing his plant as a new species with the name *Agaricus decipiens*.‡ It seems evident, therefore, that even the earlier botanists were more or less in doubt as to the identity of the Linnaean plant.

About 1800, Olof Swartz sent to Persoon a specimen from Sweden which he affirmed to be the true *Hydnum parasiticum* L. This plant Persoon figured and fully described under the Linnaean name in his *Icones et Descriptiones Fungorum* 2: 55. pl. 14, f. 2. 1800. The figure is so well executed that it leaves no doubt as to the plant represented. Soon after this was published Swartz wrote Persoon, according to the latter, that the plant was not the *Hydnum parasiticum* of Linnaeus. Persoon now did a

* *Flora Pomerano-Rugica*, 222. 1769.

† *Florae Berolinensis Prodomus*, 396. 1787.

‡ *Observationes Botanicae in Mag. für die Bot.* 12. pl. 2, f. a, b, c. 1788.

peculiar thing. He published the Swartzian plant in his *Synopsis Methodica Fungorum*, in 1801, as *Hydnum parasiticum*, but stated that it was not *Hydnum parasiticum* L. Persoon appears to have disposed of the Linnaean plant by transferring it to the genus *Sistotrema*, for he says, "quod vide sub *Sistotremate*," but in his treatment of the genus *Sistotrema* there is no citation of the Linnaean species and none of the descriptions seem to apply to that form. From this date the Linnaean plant appears to have been disregarded by botanists.

In 1810, Swartz himself described the plant which he had sent to Persoon and named it *Hydnum strigosum*.* Neither Swartz nor the later European botanists have laid any special emphasis on the branched processes which are a peculiar characteristic of the body of this Swartzian plant, although this feature is figured and mentioned by Persoon; nor have we noted any mention of the hot, peppery taste of the fresh plant, which is a striking and characteristic feature.

About 1840 or a little later, T. G. Lea collected in Ohio a resupinate plant which in other respects possessed all the characteristic features of *H. strigosum* Sw. This was sent to Rev. M. J. Berkeley, of England, who described it in 1845 as *Hydnum stratosum*.† Berkeley commented extensively on the unique feature of the branched processes, remarking that it was one of the most remarkable species with which he was acquainted. He likens the plant to "*Hydnum parasiticum*," but says it "has not like that a coriaceous pileus." His citation of name without author has in this case little significance. If he referred to *H. parasiticum* Pers., it was the same as *H. strigosum* Sw., but in that case his comment is misleading, since the structure and substance of the pilei of *H. strigosum* Sw. and *H. stratosum* Berk. are essentially alike and both are characterized by the branched processes.

H. stratosum Berk. appears never to have been reported from Europe and seems to be rare in this country. A. P. Morgan, who lived and collected in the same region of Ohio where Lea did, commented many years later on the fact that *H. stratosum* Berk.

* Kongl. Vetensk. Acad. nya Handl. 1810: 250. 1810.

† Lond. Jour. Bot. 4: 307. 1845.

had never been found again and expressed serious doubt as to its existence.* However, the plant does exist and is a good species. In 1887, Underwood and Cook found specimens in central New York which were correctly determined by C. H. Peck as *H. stratosum* Berk., and again Underwood found a specimen of the same species in Indiana in 1891. So far as the writer can determine, these three collections are the only ones made of this species in the world.

In 1904, the writer, searching through the vast accumulation of the Ellis collection at the New York Botanical Garden, discovered a specimen which he recognized as having the fundamental characters of *H. stratosum* Berk., but it was distinctly pileate. This specimen was collected by Ellis as early as 1855, and had been submitted to Ravenel, who replied "new and very curious." The plants, however, had never been described, probably because the material was scanty. Later specimens having the branched character greatly obscured by a more compact pileus were referred by Ellis to *H. strigosum* Sw. It was the writer's fortune the next summer after seeing these specimens to find a fine growth of the plant on an old stump in a deep, moist hollow at Schaghticoke, N. Y., where an abundance of fresh material was obtained.† The possibility of the plant's being *H. strigosum* Sw. was considered, but authentic material of Swartz's plant could not be obtained, and at that time a copy of Persoon's paper, *Icones et Descriptiones Fungorum*, was not accessible. The failure of the European botanists to emphasize the most unique feature of the plant and especially Berkeley's comment on that feature led the author to believe that the plant represented a distinct species. Moreover, the unusual character seemed to warrant the segregation of this and Berkeley's species as a separate genus. The plant was, therefore, described and named *Leaia piperata*.‡

Recently, among some material received from Dr. Lars Romell, of Sweden, were found a few specimens of what is there con-

* Jour. Cin. Soc. Nat. Hist. 10: 9. 1887.

† This old stump has continued to furnish a crop of the sporophores every year since, this being the sixth consecutive season that they have been observed.

‡ Mem. Torrey Club 12: 175. 1906.

sidered *Hydnum strigosum* Sw. These were at once recognized as being the same as *Leaia piperata*. A copy of Persoon's *Icones et Descriptiones Fungorum* was examined during the past summer and it was evident that the two species were identical. In the publication of the writer's Contribution to a revision of the North American Hydnaceae,* it seemed necessary to include *Hydnum strigosum* Sw., although the species was not well understood, since there had been found in the Schweinitz herbarium a peculiar plant that had been referred to the above species, and correctly, so far as could be determined. On the evidence of the Schweinitz specimen and the supposedly correct interpretation of Swartz's description, the species was placed in the genus *Steccherinum* and inadequately described, as was intimated at the time. It now seems doubtful if the Schweinitz specimen is the true *Hydnum strigosum* Sw., but a reëxamination of the plant would be necessary to positively settle the question. Be that as it may, it is now evident that the Swartzian species was wrongly disposed of.

With the settling of the question as to what constituted the true *H. strigosum* Sw., a new problem arose. The writer had made his species *Leaia piperata* the type of a new genus. With the determination of the identity of his plant with the Swartzian species, it is evident that the latter becomes the type of the genus. However, in 1879, P. A. Karsten had established the genus *Gloiodon* on *Hydnum strigosum* Sw. and two other species.† Ten years later he established the monotypic genus *Sclerodon* on *H. strigosum* Sw., quoting his own genus *Gloiodon* as a synonym.‡ In accordance with the principles here followed,§ the genus must be known as *Gloiodon*.

The correct nomenclature of the two species here discussed, with their synonymy, would, therefore, be as follows:

GLOIODON STRIGOSUS (Sw.) P. Karst., Medd. Soc. Faun. et Fl. Fenn. 5: 28. 1879.

* Mem. Torrey Club 12: 99-194. 1906.

† Medd. Soc. Faun. et Fl. Fenn. 5: 28. 1879.

‡ Finlands Basids. 360. 1889.

§ See Banker, A historical review of the proposed genera of the Hydnaceae, Bull. Torrey Club 29: 436-448. 1902.

Hydnum parasiticum Persoon, Icon. et Descrip. Fung. 2: 55.
pl. 14, f. 2. 1800. Not *H. parasiticum* L. Sp. Pl. ed. 2, 2:
1648. 1763.

Hydnum strigosum Swartz, Kongl. Vetensk. Acad. nya Handl.
1810: 250. 1810.

Sclerodon strigosus (Sw.) P. Karst., Finl. Basidsv. 361. 1889.

Steccherinum strigosus (Sw.) Banker, Mem. Torrey Club 12:
128. 1906.

Leaia piperata Banker, Mem. Torrey Club 12: 175. 1906.

Gloiodon stratosus (Berk.) comb. nov.

Hydnum stratosum Berkeley, Lond. Jour. Bot. 4: 307. 1845.

Leaia stratosa (Berk.) Banker, Mem. Torrey Club 12: 177.
1906.

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THREE COMMON SPECIES OF AURICULARIA

MARY F. BARRETT

I. *Auricularia Auricula* (L.) Underwood, Mem. Torrey Club

12: 15. 1902

- Tremella Auricula* L. Sp. Pl. 1157. 1753. .
Peziza Auricula L. Syst. Nat. ed. 12, 2: 725. 1767.
Merulius auricula Roth. Germ. 1: 535. 1788.
Peziza Auricula-Judae Bull. Champ. 1: 241. 1791.
Tremella Auricula Judae Pers. Obs. Myc. 2: 93. 1799.
Auricularia sambucina Mart. Fl. Crypt. Erl. 459. 1817.
Exidia Auricula Judae Fr. Syst. 2: 221. 1822.
Auricularia ampla Pers. in Freyc. Voy. 177. 1826.
Exidia auricula Wallr. Fl. Crypt. 2: 559. 1833.
Exidia ampla Lév. Ann. Sci. Nat. Bot. III. 5: 159. 1846.
Hirneola auricula-Judae Berk. Outl. 289. 1860.
Hirneola ampla Sacc. Syll. 6: 765. 1888.
Auricularia Auricula Judae Schröt. Krypt. Fl. Schles. 3: 386. 1889.
Auricula Judae Kuntze, Rev. Gen. 2: 844. 1891.
Auricula ampla Kuntze, Rev. Gen. 2: 844. 1891.

Erumpent, single or cespitose; at first peziza-form, then becoming erect and foliaceous, much twisted, slightly ear- or shell-shaped, one or several lobed, sessile or substipitate, up to 12 cm. in height; thin gelatinous, trembling when moist; sterile surface curling over hymenium, red-brown when moist, yellowish-brown to olive-brown when dry, when young glaucous, when older ashy, pruinose with fine short hairs, irregularly veined, sometimes appearing quilted; hymenium when moist red-brown like coffee jelly, smooth, undulating but not folded or wrinkled; hymenium when dry or old becoming almost black, shining, or dull with a white bloom, sometimes folded according to manner of drying; spores typical of the genus, $11-14 \times 5-6 \mu$.

HABITAT: Dead wood of various kinds.

DISTRIBUTION IN NORTH AMERICA: Wide. Specimens were examined from various parts of Canada, Maine, New Hampshire,

Connecticut, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, West Virginia, South Carolina, Georgia, Alabama, Louisiana, Arkansas, Missouri, Tennessee, Ohio, Indiana, Iowa, Minnesota, Kansas, Colorado, Montana, the West Indies, and the Philippines. It is reported also from Massachusetts, North Carolina, Texas, Nebraska, and California.

EXSICCATI: There are specimens in most of the usual European and American exsiccati.

ILLUSTRATIONS: Hussey, Ill. Brit. Myc. *pl.* 53; Eng. Bot. cd. 1: 2447; Berk. Outl. *pl.* 18, *f.* 7; Cooke, Handbook, *f.* 97; Bolt. Hist. Fungi, 2: *pl.* 107; Batt. Fung. Agri. *pl.* 3, *f.* F; Sterb. Theat. *pl.* 27, *f.* H; Mich. Nov. Gen. *pl.* 66, *f.* 1; Blackw. Herball, *pl.* 334; Marshall, Mushroom Book, 116; Brefeld, Unters. 7: *pl.* 4, *f.* 3, 4.

This fungus is the well-known Jew's ear or Judas' ear, which was described under that name at least as far back as the end of the sixteenth century. Since that time it has had perhaps three times as many names as the above list of synonyms would seem to indicate. Undoubtedly many even of the comparatively recently described species of *Auricularia* will eventually be referred back to this species.

Such multiplication of names is of course due to the wide distribution of the Judas' ear, to its ability to grow upon many different kinds of decaying wood, and to its great variation in size, color and shape. Young specimens are usually not only smaller, but lighter in color and smoother. Gradations in this respect were admirably shown by one set of specimens from Jamaica (No. 1123, Mrs. N. L. Britton Coll., Oct. 4, 1908). Then too, in a fungus of which about 80 per cent. is water (Weems & Hess in Proc. Soc. Prom. Agr. Sci 23: 167. 1902) the method of drying will affect its appearance, and may lead to confusion unless specimens to be determined are soaked with water until they regain their original condition.

The chief interest of the Jew's ear for the botanists of the seventeenth and eighteenth centuries seems to have lain in the question of its edibility. Gerarde (Herball, 1385. 1597) says: "the Mushrooms or Toadstooles which grow upon the trunks or bodies of old trees, verie much resembling Auricula Judae, that

is Iewes' care . . . are all thought to be poisonous being inwardly taken." L'Ecluse (Hist. Rar. Pl. 4: 276. 1601) although naming it "genus 1. perniciosum fungorum" says that it may be used in cases of sore throat for gargling and rinsing. Parkinson (Theat. 1320. 1640) states positively that it must be edible, because it may be "boyled in milke, or steeped in vinegar and so gargled, which is the onely use they are put unto that I know." The final word on the subject has been given recently by Weems and Hess in the article quoted above. They state its composition when moist to be: water 79.58 per cent., ether extract .25 per cent., crude fiber .59 per cent., protein 3.83 per cent., ash 1.04 per cent., nitrogen free extract 14.71 per cent. Its fuel value per lb. in calories is 355.10.

It is altogether probable that *Auricularia auriformis* (Schw.) Earle is the same fungus. The only difference seems to be in the yellow color on both surfaces of *A. auriformis*, due in the case of the hymenium to nodules of gelatine, and on the sterile surface to the hairs. Specimens from various localities in New Jersey and Alabama were examined, and the fungus is reported also from Massachusetts, Virginia, North Carolina (type), Ohio, and Porto Rico. The Wright specimen from Cuba is, as stated by Farlow (Bib. Index 1: 306. 1905), not *A. auriformis* but *A. Auricula*.

If these two fungi prove to be the same the following synonyms should be added to those of *A. Auricula*:

Peziza auriformis Schw. Syn. Carol. no. 1155. 1818.

Exidia auriformis Fr. Syst. 2: 223. 1822.

Tremella auriformis Spreng. in L. Syst. Veg. ed. 16. 4: 535. 1827.

Exidia protracta Lév. Ann. Sci. Nat. III, 2: 218. 1844.

Hirneola auriformis Fr. Fung. Nat. 26. 1848.

Hirneola protracta Sacc. Syll. 6: 766. 1888.

Auricula auriformis Kuntze, Rev. Gen. 2: 844. 1891.

Auricula protracta Kuntze, Rev. Gen. 2: 844. 1891.

Auricularia auriformis Earle in Mohr, Contrib. U. S. Nat. Herb. 6: 194. 1901.

2. *Auricularia nigrescens* (Sw.) Farl. Bib. Index, 1: 308. 1905

Peziza nigrescens Sw. Prod. 150. 1788.

Peziza nigricans Sw. Fl. Ind. Occ. 3: 1938. 1806.

Exidia purpurascens Jungh. Praem. 25. 1838.

Exidia hispidula Berk. Ann. Nat. Hist. I. 3: 396. 1839.

Exidia polytricha Mont. Pl. Cell. Cuba, 365. 1841.

Hirneola nigra Fr. Fung. Nat. 27. 1848.

Hirneola polytricha Fr. Nov. Act. Roy. Soc. Sci. Upsal. III., 1: 117. 1855.

Hirneola hispidula Berk. Jour. Linn. Soc. 14: 352. 1874.

Auricularia polytricha Sacc. Misc. 2: 12. 1885.

Auricula hispidula Kuntze, Rev. Gen. 2: 844. 1891.

Auricula nigra Kuntze, Rev. Gen. 2: 844. 1891.

Auricula polytricha Kuntze, Rev. Gen. 2: 844. 1891.

Auricularia nigra Earle, Bull. Torrey Club 26: 633. 1899.

Auricularia hispidula Farl. Bib. Index 1: 307. 1905.

Leathery-gelatinous, peziza-shaped at first, becoming cup- or ear-shaped, or foliaceous, erect, sessile, or slightly stipitate, one or several lobed, up to 10 cm. in diameter, tough even when moist; sterile surface external in cup forms, superior in foliaceous forms, densely tomentose with hairs longer than those of *A. Auricula*, red-brown when moist, becoming usually light gray or tan when dry resembling chamois, but sometimes red-brown or almost black when old, not usually wrinkled but sometimes appearing quilted, usually pleated near place of attachment, zoneless, margin frequently turned under; hymenium interior or inferior, red-brown, becoming black when dry, usually smooth, sometimes papillate; spores typical of the genus, $14-15 \times 5-7 \mu$.

TYPE LOCALITY: Jamaica.

HABITAT: On dead wood.

DISTRIBUTION IN NORTH AMERICA: Alabama, southern Florida and the tropics.

This plant differs from *A. Auricula* in its tougher texture, longer and lighter hairs, and unwrinkled sterile surface. There are two common forms which most writers have considered separate species: *A. nigra*, forming cups; and *A. polytricha*, spreading into lobes. Montaigne (Pl. Cell. Cuba, 365. 1841) notes that young specimens are cup-shaped at first, and then expand. This

fact was exemplified in several of the collections examined, in one of which (Cuba, Earle & Murrill 102) little cups were seen growing from old ear-shaped pieces. Furthermore, comparatively few of the *A. nigra* forms showed spores, thus indicating that the plants were probably immature. The spores when present were like those of *A. polytricha*.

3. ***Auricularia mesenterica*** (Dicks.) Pers. Myc. Eur. 1: 97. 1822

Helvella mesenterica Dicks. Crypt. 1: 20. 1785.

Helvella tremellina Sw. Prod. 149. 1788.

Thaëlaephora mesenterica Gmel. Syst. Nat. II., 2: 1440. (1792.)

Merulius mesentericus Schrad. Sp. 138. 1794.

Thelephora tremellina Sw. Fl. Ind. Occ. 1935. 1806.

Auricularia ornata Pers. in Freyc. Voy. 177. pl. 2, f. 4. 1826.

Auricularia lobata Sommerf. in Mag. Nat. Vidensk. 1827.

Phlebia mesenterica Fr. El. 154. 1828.

Patila mesenterica Kuntze, Rev. Gen. 2: 864. 1891.

Patila lobata Kuntze, Rev. Gen. 2: 864. 1891.

Tough, not swelling much with moisture, when young peziza-like with hairy margin, becoming resupinate or shelving, attached posteriorly but not stipitate, up to 15 cm. in length, 11 cm. in breadth, and 4 mm. in thickness; upper surface sterile, wholly or partly tomentose in distinct zones of light- and dark-brown or red shading to greenish or tan at the edge, sometimes showing bare zones, margin usually in rounded lobes, frequently turned under; hymenium inferior, red-brown, becoming almost black when dry, when mature wrinkled like a mesentery, often frosted or covered with a yellow bloom; spores typical of the genus, $10-12 \times 5-6 \mu$.

TYPE LOCALITY: For *Helvella tremellina* Sw., Jamaica.

HABITAT: On dead and decaying wood.

DISTRIBUTION IN NORTH AMERICA of specimens examined: West Indies, Central America, and the Philippines. It is reported also from Maine, Massachusetts, Rhode Island, and North Carolina.

EXSICCATI: Cavara, Fungi Longob. 12; Roum. Fungi Sel. 7203; Moug. & Nestl. Stirp. Crypt. Vog.-Rhen. 492; Rab.-Winter Fung. Eur. 3132.

ILLUSTRATIONS: Hussey, Ill. Brit. Myc. 2: pl. 6; Mich. Gen. pl. 66, f. 4.

A. mesenterica resembles a *Stereum*. It differs from *A. nigrescens* in having zones and a wrinkled hymenium. The hairs, too, are longer and darker in color, and the whole plant lies closer to the surface from which it grows. The form having mixed bare and hairy zones was formerly called *A. lobata*. Among the specimens examined, however, were several which showed both the hairy and the mixed zones in the same collection, thus confirming the theory of Montagne (Pl. Cell. Cuba 373. 1841) and of others, that they belong to the same species.

A. tremelloides Bull. (Champ. pl. 290. 1786) is often considered a synonym, but the illustration shows a crater-like form with alveolate folds on the outside. If this, however, is *A. mesenterica*, it and its dependent species, *A. corrugata* (Relh.) Sowerb. (Brit. Fung. pl. 290. 1803) and *Tremellidium tremelloides* (Bull.) Chev. (Fl. Gen. 1: 92. 1826) should be added to the above list.

SUMMARY

Auricularia Auricula (L.) Underwood includes forms sometimes known as *A. sambucina* Mart. and as *A. ampla* Pers. Probably *A. auriformis* (Schw.) Earle and possibly half a dozen other foliaceous species also belong here. *A. Auricula* differs from *A. nigrescens* in possessing a thinner texture, shorter and darker hairs, and veins upon the sterile side. As compared with *A. mesenterica* it is foliaceous rather than resupinate or shelving, is much thinner, has fewer and shorter hairs and is zoneless.

A. nigrescens (Sw.) Farlow comprises *A. nigra* (Fries) Earle (cup-shaped) and *A. polytricha* (Mont.) Sacc. (lobed) besides the less known species of *Exidia purpurascens* Jungh. and *A. hispidula* (Berk.) Farlow. It differs from *A. mesenterica* in its absence of zones, in its shorter and lighter hairs, in its smooth hymenial surface, and in its more expanded shape.

A. mesenterica (Dicks.) Pers., *A. lobata* Sommerf., and *A. ornata* Pers. are the same species, and it is probable that *A. tremelloides* Bull. and *A. corrugata* (Relh.) Sowerb. also belong here.

The collections examined are those in the herbarium of the New York Botanical Garden. Most of them were obtained recently from the tropical portions of this country, but there are specimens from foreign exsiccati also, and from other places in North America which have been noted above.

NEW JERSEY STATE NORMAL SCHOOL,
MONTCLAIR, N. J.

A FUSARIUM DISEASE OF THE PANSY

F. A. WOLF

(WITH PLATE 18, CONTAINING 4 FIGURES)

The pansy, *Viola tricolor* L., seems to be affected by only a few widely distributed fungi. According to Saccardo's "Sylloge Fungorum," the following fungi are known to occur on the pansy in various parts of the world: *Asteroma latebrarum* Grogg., France; *Catharinia americana* (Ell. and Ev.) Sacc., America; *Cercospora Violae-tricoloris* Br. and Cav., Italy; *Oidium Violae* Pass., Italy; *Peronospora Violae* De Bary, Germany, Britain, America; *Phyllosticta Violae* Desm., Germany, Hungary, Italy, Britain, France; *Puccinia Violae* (Schum.) DC., Europe, Asia, America; *Ramularia agrestis* Sacc., Germany, Italy; *Ramularia lactea* (Desm.) Sacc., Germany, Hungary, Italy, France, Britain; *Synchytrium aureum* Schroet., Europe, America; *Urocystis Violae* (Sow.) Fisch., Germany, Britain, Holland, Italy, France; *Phoma Violae-tricoloris* Diedicke, Germany; *Cladochytrium Violae* Berlese, Italy; *Colletotrichum Violae-tricoloris* Smith, America.

Most of these fungi occur on the leaves, several of them being saprophytic or else appearing only on languid or dying leaves. The violet rust, *Puccinia Violae*, which is parasitic on all of the aërial parts of the plant, is perhaps the most common. The violet smut, *Urocystis Violae*, appears on the petioles and leaves and has been generally reported from Europe. *Colletotrichum Violae-tricoloris* causes a spotting of the leaves very similar in appearance to the common leaf-spot of the violet and also affects the petals, causing them to die along the margins and often inhibiting their development so that the flowers are malformed. *Cladochytrium Violae*, one of the Chytridineae, is parasitic on the roots of pansies in Italy, forming its spores within the tissue of the host. It is only in extreme cases that the entire plant or entire beds are killed by the ravages of any of these forms, although some parts of the plants are often badly affected.

During the past two years a stem and root disease has been

observed at Lincoln, Nebraska, which has been found to be due to a hitherto undescribed fungus. The disease has proved very destructive, hence its consideration is of economic importance.

The disease is characterized by the sudden dying of the plants. Individuals which are apparently healthy will in a few days be dry and dead. When one of these is pulled up, a dark, slightly sunken area on the stem just at the surface of the ground is apparent. The root-system is destroyed so that only stubs of the main roots are left, the smaller parts having been disintegrated. Several entire beds were observed to be thus destroyed, the dying occurring in the month of July.

On July 12, 1907, plants from a bed which was then almost completely lost, were brought into the laboratory. The stems were first washed in tap-water and then dipped for a moment in a mercuric chloride solution 1:1000. The outer parts were then removed with a sterile scalpel and a portion of the inner tissue from one of the diseased areas was placed on glucose agar plates. When proper precautions were observed to prevent contamination, these plates gave in every instance pure cultures of a *Fusarium*.

The species of *Fusarium* have been generally regarded as saprophytic. Within the last few years, quite a number have been found to be truly parasitic during part of their life, or at least facultative saprophytes. Among these are a flax wilt* reported from North Dakota; a species which destroys green tomatoes† in the field; and another which attacks cultivated peas.‡

In order to determine the mode of life of this species of *Fusarium*, inoculations were made during the summer of 1908. A small portion of the agar with the hyphae and spores was placed just beneath the surface of the ground near the plants, care being taken to inflict no injury to them. In a month these plants had developed the characteristic brown areas on the stems and died, while the check plants remained normal. Planted plates made from the diseased places, using the same care as before to prevent contamination, gave in turn pure cultures of the *Fusarium*. Microscopic examination revealed the presence of fungus fila-

* Bolley, Bull. N. D. Exp. Sta. 50. 1901.

† Smith, Tech. Bull. Mass. Exp. Sta. 3. 1907.

‡ Schikora, Dissertation Berlin, 1-34. 1906.

ments in the stem tissue, and the presence of spores in the center of the stem.

At the same time, a large bed was noticed in which the plants were all killed, which on examination and by cultures proved to be due to the same *Fusarium*.

Since no species of *Fusarium* have been described as occurring on the pansy or other members of the violet family, the name *Fusarium Violae* is proposed for this species, which is characterized as follows:

***Fusarium Violae* sp. nov.**

Parasitic on the stems and roots of *Viola tricolor*, causing the formation of dark, sunken areas on the stems and the destruction of the root-system. Macrospores hyaline, fusiform-falcate, $28-38\mu$ long and $4-6\mu$ wide, 3-5-septate. Sporodochia borne within the stems. In cultures, the hyphae are white and cottony, and the microspores, which are $8.5-12.5 \times 2-3.5\mu$, are formed profusely from short side branches. In hanging drop cultures, these spores are capable of very vigorous growth, forming much-branched hyphae.

Hyphis mycelii hyalinis, $4-7\mu$ diam., irregulariter ramosis, matricem truncorum et radicum penetrantibus; sporodochiis intus, forma indefinita. Macroconidiis hyalinus, fusiformibus falcatis, $28-38 \times 4-6\mu$, 3-5 septatis; microconidiis continuis, $8.5-12.5 \times 2-3.5\mu$, e conidiophorum ramulis brevibus oriundis.

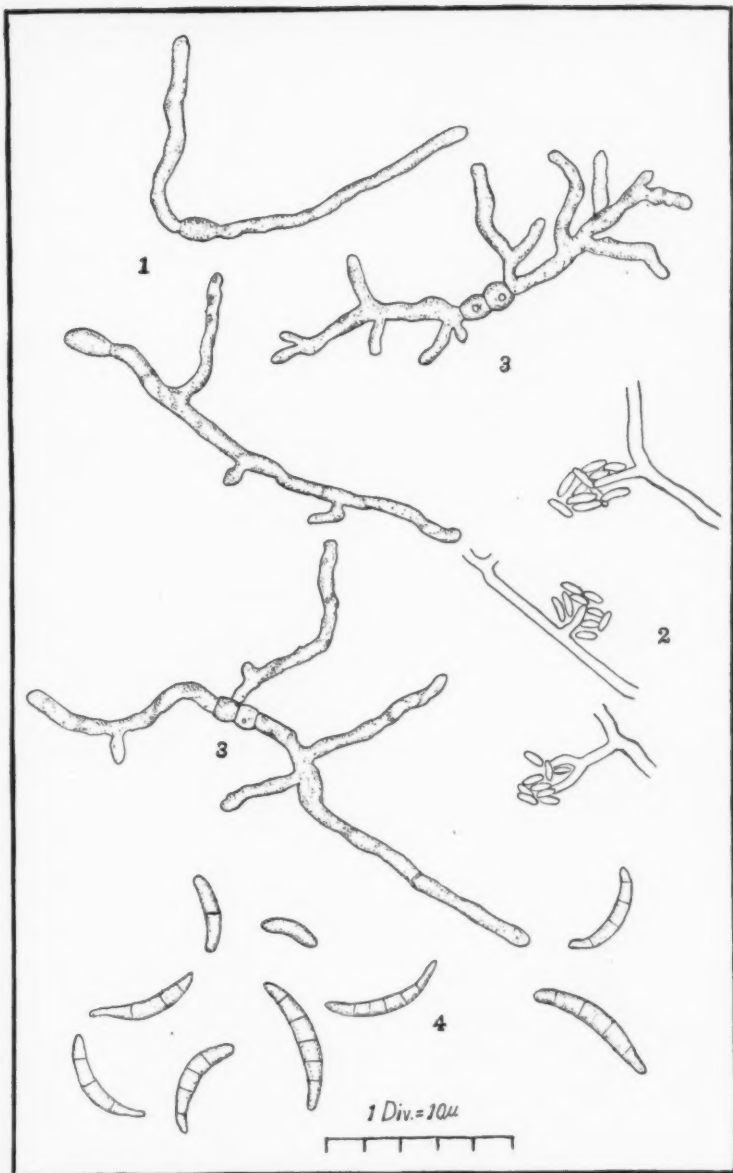
Hab. in truncis vivis et radicibus *Violae tricoloris*, quam destruit; in truncis maculis brunneis vel nigris factis, et radicibus destructis.

One factor was observed in connection with this fungus which might lead to its control. The pansies were destroyed only in those beds which had been fertilized with barnyard manure just previous to planting. Other beds which were not thus enriched before planting were normal. If due precaution is taken that the fertilizers are perfectly decomposed and mixed with the soil before the plot is used for a pansy bed, no injury may be expected. This can, perhaps, be best accomplished by applying the fertilizers in the season previous to the one in which the ground it to be used for pansies.

SCHOOL OF BOTANY,
UNIVERSITY OF TEXAS,
AUSTIN, TEX.

EXPLANATION OF PLATE XVIII

- Fig. 1. Germination of microconidia.
Fig. 2. Formation of microconidia as shown in hanging-drop cultures.
Fig. 3. Germination of macroconidia.
Fig. 4. Various forms of macroconidia.



FUSARIUM VIOLAE WOLF

NOTES ON UREDINEAE—V

E. W. D. HOLWAY

PUCCINIA PORTERI Peck

This species was collected in Colorado by J. M. Coulter and the host reported as *Veronica alpina*. The type has recently been examined and found to be *Puccinia Holboellii*, on some crucifer, probably *Arabis*.

PUCCINIA ALBULENSIS P. Magn.

This is the name by which the common American *Puccinia* on *Veronica alpina* must be known. It is very common in the Canadian Mountains, occurring above timber line or on the moraines near the ice.

PUCCINIA RHAETICA Ed. Fischer

This species has not been hitherto reported for North America, but it is abundant at about 6,500 feet elevation on Mt. Ranier, growing on *Veronica Cusickii*.

PUCCINIA TRIFOLIATA E. & E.

This proves to be *Puccinia Osmorrhizae* C. & P., on *Osmorrhiza* sp. It was collected at Seattle, Washington, by C. V. Piper and reported to be on *Tiarella trifoliata*.

PUCCINIA PALLIDA Tracy

This is *Puccinia Anemones-virginianae* Schw., on some *Anemone*. It was collected in Wisconsin by S. M. Tracy and published as on *Osmorrhiza*.

PUCCINIA OREGONENSIS Earle

This species was collected in Oregon by Moses Craig, said to be on *Sanicula bipinnata*. The packets contain the fruit of the *Sanicula* and the leaves of a *Leptotaenia*, with the fungus on the

leaves only. It is *Puccinia asperior* E. & E. The host is probably *Leptotacnia dissecta*.

PUCCINIA LIGUSTICI E. & E.

The type of this species is not on *Ligusticum scopulorum*, but *Oxypholis Fendleri*. It has been collected at Ruby, Colorado, at 9,500 feet by C. F. Baker, on *Oxypholis*. It also occurs on species of *Ligusticum*, *Carum*, and *Angelica*. The teleutospores are not smooth, as described, but have two or three rows of small tubercles. *Puccinia luteobasis* is the same thing, but with more of the oblong spores. Similar forms occur on *Ligusticum*, and, with a large collection, it is easily seen that they cannot be separated. It was published as on an unknown umbelliferous plant. Specimens sent by Professor Bethel, said to be the same as the type, are on *Conioselinum scopulorum* (Gray) C. & R. The type specimen could not be found.

It is very interesting to note, in view of recent discoveries among the heteroecious rusts, that the teleutospores of *Puccinia Ligustici* cannot be distinguished from those of the large-spored form of *Puccinia Bistortae* on *Polygonum*. The latter has been shown to have in Europe its aecidial stage on Umbelliferae. No cultures have been made in this country, but no doubt the same is true here.

PUCCINIA MUSENII E. & E.

This species has very long, slender, 1-3-septate pedicels, and the teleutospores are closely and evenly verrucose, not reticulate. It has been distributed on *Pseudo-cymopterus* as *Puccinia Jonesii* (Pls. Wyo. No. 36, and Crypt. Form. Col. No. 139), and also as *Puccinia Pimpinellae* (Pls. Wyo. No. 7365).

UNIVERSITY OF MINNESOTA,
MINNEAPOLIS, MINN.

A NEW PHALLOID GENUS

WILLIAM A. MURRILL

Protophallus gen. nov.

Peridium epigeal, sessile, globose, of one layer, breaking into irregular fragments at maturity; volva none; mycelium inconspicuous: gleba olivaceous, odorless, attached to hyaline membranes projecting from the inner surface of the peridium at regular intervals and floating free at maturity in a hyaline, gelatinous liquid: spores very minute, ellipsoid, subhyaline under a microscope.

Protophallus jamaicensis sp. nov.

Peridium spherical, white at maturity, 4 cm. in diameter, consisting of a single layer 1 mm. thick, resembling parchment, the entire peridium breaking at the maturity of the spores into several large, irregular pieces; gleba attached to the peridium by thin, radial, hyaline, membranous plates and projecting in elongated, olivaceous, odorless masses nearly or quite to the center of the sporophore, the remaining space being filled at maturity with a homogeneous, hyaline, semigelatinous, odorless liquid; spores very copious, oblong-ellipsoid, smooth, subhyaline under a microscope, $3.5 \times 1.5 \mu$.

Type collected January 7, 1909, on shaded soil rich in humus on the bank of the Clyde River near Cinchona, Jamaica, at an elevation of 1,600 meters, *W. A. Murrill 567*.

When first observed, this species was thought to be the "egg" of a *Phallus*, but, on making a section, it was found to be quite mature and utterly devoid of a stipe or other elongating tissue. At the first incision, the hyaline liquid exuded, soon followed by lobes of the olivaceous, sporogenous tissue, which floated free like the gills of a fish or the mantle of an oyster. The liquid resembled the white of an egg, but poured out in large drops like semi-fluid jelly. It was probably the result of deliquescence. The membranous plates to which the spore-masses were attached were as regular in arrangement as the partitions of an orange, but they did not extend to the center. Miss Taylor, who was study-

ing at Cinchona at the time, placed a section of the gleba under her microscope and made a pencil sketch of it for me. She found the sterile threads to be hyaline, septate, interwoven, and slightly larger than the spores.

The remains of another specimen were found near the first, and these served to indicate the method of spore dissemination, which is evidently by means of rain. There is no odor about the plant to attract insects and no stipe to lift the gleba in air; when the spores are mature, the interior tension evidently ruptures the weakened peridium and allows the liquid containing the countless minute spores to escape, when the frequent rains effect their wide distribution.

The generic name assigned refers to the resemblance of this species to the "egg," or undeveloped stage, of a species of *Phallus*. The affinities of the genus appear to be with *Phallogaster*.

Since the above was written, Miss Taylor has brought in three specimens collected by her on the same spot as the types. They all show a single mycelial cord attaching the fruit-body to the underground mycelium. In the young stages the peridium appears to be avellaneous becoming white at maturity.

NEW YORK BOTANICAL GARDEN

THE LACTARIAE OF NORTH AMERICA— FASCICLES I AND II*

GERTRUDE S. BURLINGHAM

1. LACTARIA PIPERATA (L.) Pers. Tent. Disp. Meth.
Fung. 64. 1797

Agaricus piperatus L. Sp. Pl. 1173. 1753.

Agaricus Listeri With. Brit. Pl. ed. 2. 3: 288. 1792.

HABITAT: In oak woods or groves.

DISTRIBUTION: In the eastern and southern United States, in the middle west, and in California.

2. LACTARIA PERGAMENA (Sw.) Fries, Epicr.
Myc. 340. 1838

Agaricus pergamenus Sw. Kongl. Sv. Vet. ac. Handl. II. 30:
90. 1809.

HABITAT: In oak woods.

DISTRIBUTION: In the United States east of the Mississippi.

3. LACTARIA VELLEREA Fries, Epicr.
Myc. 340. 1838

Agaricus vellereus Fries, Syst. Myc. I: 76. 1821.

HABITAT: In rather open deciduous woods.

DISTRIBUTION: In the eastern United States from Maine to Alabama.

4. LACTARIA DECEPTIVA Peck, Ann. Rep. N. Y. State
Bot. 38: 125. 1885

HABITAT: In woods under or near hemlock trees; only rarely in oak-chestnut woods.

DISTRIBUTION: In the eastern United States from Maine to Alabama.

* Most of the specimens in these two fascicles are accompanied by photographs of the living plants.

5. *LACTARIA GLAUDESCENS* Crossl. Nat. 1900: 5. 1900

HABITAT: On the ground in sandy loam or in vegetable soil, oak-chestnut woods.

DISTRIBUTION: Pisgah Forest, North Carolina, at 1,000 meters elevation.

6. *LACTARIA TORMINOSA* (Schaeff.) Pers. Tent. Disp.
Meth. Fung. 64. 1797

Agaricus torminosus Schaeff. Fung. Bav. Icon. 4: 7 (index). 1774.

*Lactaria** *villosa* Clements, Bot. Surv. Neb. 4: 20. 1896.

HABITAT: In either coniferous or deciduous woods.

DISTRIBUTION: From Maine to Alabama, and west to Colorado and Nebraska.

7. *LACTARIA RESIMA* Fries, Epicr. Myc. 336. 1838

Agaricus resimus Fries, Hym. Eur. 472. 1821.

HABITAT: In mixed woods, chiefly in mountainous regions.

DISTRIBUTION: New York; Windham County, Vermont, at an elevation of about 500 meters.

8. *LACTARIA SPECIOSA* Burl. Mem. Torrey Club 14: 34. 1908

HABITAT: In sandy soil, oak-chestnut woods, in dry as well as wet weather.

DISTRIBUTION: North Carolina, Tennessee, and Virginia, from 670 to 1,200 meters elevation.

9. *LACTARIA CROCEA* Burl. Mem. Torrey Club 14: 37. 1908

HABITAT: In vegetable mold and dead leaves, oak-chestnut woods.

DISTRIBUTION: Pisgah Forest, North Carolina, at 1,000 meters elevation.

10. *LACTARIA RUSTICANA* (Scop.) Burl. Mem. Torrey
Club 14: 27. 1908

Agaricus rusticanus Scop. Fl. Carn. 2: 452. 1772.

Agaricus pyrogalus Bull. Herb. Fr. pl. 529, f. 1. 1791. Hist. Champ. 1.: 487.

* *Lactaria* is here used uniformly, although spelled *Lactarius* by most authors.

Lactarius pyrogalus Fries, Epicr. Myc. 339. 1838.

HABITAT: In open grassy places in woods.

DISTRIBUTION: New York, Vermont, Ohio, and Maryland.

11. LACTARIA AGGLUTINATA Burl. Mem. Torrey

Club 14: 42. 1908

HABITAT: In oak-chestnut woods.

DISTRIBUTION: Pisgah Forest, North Carolina, at an elevation of 1,000 meters.

12. LACTARIA TURPIS (Weinm.) Fries, Epicr.

Myc. 335. 1838

Agaricus Necator Pers. Syn. Fung. 435. 1801. Not *Agaricus*

Nector Bull. Herb. Fr. pl. 14; pl. 529, f. 2. 1780.

Agaricus turpis Weinm. Syl. Pl. Nov. 2: 85. 1828.

Lactarius sordidus Peck, Ann. Rep. N. Y. State Mus. 23: 119. 1872.

HABITAT: On the ground in mixed woods, often near fir or spruce trees.

DISTRIBUTION: From Maine to Ohio, and probably in North Carolina.

13. LACTARIA ASPIDEOIDES Burl. Bull. Torrey

Club 14: 87. 1907

HABITAT: In a grassy hillside sheep-pasture, near small fir trees.

DISTRIBUTION: Newfane, Vermont.

14. LACTARIA LIVIDORUBESCENS (Batsch) Burl. Mem.

Torrey Club 14: 49. 1908

Agaricus lividorubescens Batsch, Elench. Fung. 2: 51. pl. 36, f. 202. 1789.

Agaricus uvridus Fries, Obs. Myc. 2: 191. 1818.

Lactaria uvrida Fries, Epicr. Myc. 338. 1838.

Lactarius livescens Passerini, Nuovo Giorn. Bot. Ital. 4: 105. 1872.

HABITAT: On the ground in moist mixed woods.

DISTRIBUTION: Eastern United States as far south as Maryland.

15. LACTARIA INSULSA Fries, Epicr.

Myc. 336. 1838

Agaricus insulsus Fries, Syst. Myc. I.: 68. 1821.

HABITAT: On the ground in rather open places in oak-chestnut woods.

DISTRIBUTION: From Maine to Alabama and Missouri.

16. LACTARIA AFFINIS Peck, Rep. N. Y. State

Cab. 23: 118. 1873

Lactaria platyphylla Peck, Rep. N. Y. State Cab. 23: 118. 1873.

HABITAT: In mixed balsam and maple woods.

DISTRIBUTION: Maine, Vermont, and Massachusetts.

17. LACTARIA TRIVIALIS Fries, Epicr.

Myc. 337. 1838

Agaricus trivialis Fries Obs. Myc. I.: 61. 1815.*Lactaria deflexa* Lindblad, Monogr. Lact. Suec. 8. 1855.

HABITAT: In deciduous woods.

DISTRIBUTION: Eastern United States from New Hampshire to North Carolina and west to Tennessee and Missouri.

18. LACTARIA CIRCELLATA Fries, Epicr.

Myc. 338. 1838

Agaricus circellatus Fries, Hym. Eur. 426. 1821.

HABITAT: In moist mixed woods.

DISTRIBUTION: Newfane, Vermont, at an elevation of 500 meters.

19. LACTARIA HYGGINA Fries, Epicr.

Myc. 337. 1838

Agaricus hyginus Fries, Syst. Myc. I.: 67. 1821.

HABITAT: In moist woods, especially near spruce trees; often in grassy borders of woods.

DISTRIBUTION: New York, Maine, Newfane and Stratton, Vermont.

20. LACTARIA MUCIDA Burl. Mem. Torrey

Club 14: 56. 1908

HABITAT: Under hemlocks in moist places.

DISTRIBUTION: Newfane and Stratton, Vermont; Pisgah Forest, North Carolina.

21. LACTARIA DELICIOSA (L.) Fries, Epicr.

Myc. 341. 1838

Agaricus deliciosus L. Sp. Pl. 1172. 1753.

HABITAT: In moist woods, especially under firs and hemlocks.

DISTRIBUTION: Eastern United States from Maine to Florida, in Colorado, and probably in California.

22. LACTARIA SUBPURPUREA Peck, Ann. Rep. N. Y.

State Mus. 29: 43. 1878

HABITAT: In moist woods in the vicinity of hemlocks.

DISTRIBUTION: New York, Vermont, Massachusetts, Connecticut, and North Carolina.

23. LACTARIA QUIETA Fries, Epicr. Myc. 343. 1838

Agaricus quietus Fries, Syst. Myc. I: 69. 1821.

HABITAT: In fir and spruce woods as well as in deciduous woods.

DISTRIBUTION: New York and Stratton, Vermont.

24. LACTARIA NITIDA Burl. Bull. Torrey

Club 34: 89. 1907

HABITAT: In moist woods, or open borders of woods.

DISTRIBUTION: Newfane and Stratton, Vermont.

25. LACTARIA OCLATA (Peck) Burl. Bull. Torrey

Club 34: 89. 1907

Lactaria subdulcis oculata Peck, Bull. N. Y. State Mus. 67:

37. 1903.

HABITAT: Under coniferous trees often in moss.

DISTRIBUTION: New York, Newfane and Stratton, Vermont.

26. LACTARIA MINUSCULA Burl. Bull. Torrey

Club 34: 88. 1907

HABITAT: In moist woods, in moss or on decayed wood, under yellow birches, black gum, and black oak.

DISTRIBUTION: New York, Vermont, and North Carolina.

27. LACTARIA CINEREA Peck, Rep. N. Y. State

Bot. 24: 73. 1872

HABITAT: Under beeches or among beech leaves.

DISTRIBUTION: Eastern United States from Maine as far south as North Carolina.

28. LACTARIA THEIOGALA (Bull.) Fries, Epicr.

Myc. 342. 1838

Agaricus theiogalus Bull. Herb. Fr. pl. 567, f. 2. 1793. Hist. 1: 495. 1809.*Hypophyllum lateritium* Paulet, Paulet & Léveillé, Icon. Champ. 59. 1855.*Lactaria brevipes* Longyear, Rep. Mich. Acad. Sci. 3: 59. 1901.*Lactaria brevis* Peck, Bull. N. Y. St. Mus. 94: 33. 1905.*Lactaria xanthogalacta* Peck, Bull. Torrey Club 34: 346. 1907.

HABITAT: In dry or moist woods under fir, spruce or oak trees.

DISTRIBUTION: From Maine to Alabama, and in California.

29. LACTARIA HELVA Fries, Epicr.

Myc. 347. 1838

Agaricus helvus Fries, Syst. Myc. 1: 72. 1821.*Lactaria aquiflua* Peck, Rep. N. Y. State Mus. 28: 50. 1877.*Lactaria aquiflua brevissima* Peck, Rep. N. Y. State Mus. 51: 298. 1897.

HABITAT: In mossy, rather wet woods or marshes.

DISTRIBUTION: From Ontario, Canada to Pennsylvania and probably North Carolina.

30. LACTARIA PECKII Burl. Mem. Torrey

Club 14: 76. 1908

HABITAT: In moist grassy wood-trails, and open places near brooks, or even in bare clay banks, in oak-chestnut woods.

DISTRIBUTION: Long Island, Staten Island, North Carolina, Alabama.

31. LACTARIA ALPINA Peck, Ann. Rep. N. Y. State

Mus. 27: 96. 1875

HABITAT: Borders of woods.

DISTRIBUTION: From New York and Vermont to Alabama.

32. LACTARIA GRISEA Peck, Ann. Rep. N. Y. State
Mus. 23: 119. 1873

HABITAT: In moist mossy places in woods, on the ground or on decaying wood.

DISTRIBUTION: From Maine to New York and Connecticut and in North Carolina.

33. LACTARIA BENSLEYAE Burl. Bull. Torrey
Club 34: 87. 1907

HABITAT: In black moist soil under yellow birch and spruce trees.

DISTRIBUTION: Newfane, Vermont.

34. LACTARIA GLYCOSMA Fries, Epicr.
Myc. 348. 1838

Agaricus glyciosmus Fries, Obs. Myc. 2: 194. 1818.

HABITAT: On the ground or on decaying wood, in woods.

DISTRIBUTION: New York, Vermont, and Missouri.

35. LACTARIA HIBBARDAE Peck, Jour.
Myc. 14: 2. 1908

HABITAT: On the ground under pine or spruce and fir trees.

DISTRIBUTION: Massachusetts and Vermont.

36. LACTARIA PLINTHOGALA (Otto) Burl. Mem. Torrey
Club 14: 84. 1908

Agaricus azonites Bull. Hist. Champ. 2: 497. 1809. Herb. Fr. pl. 567, f. 3. 1791. Probably not *Lactaria azonites* Gillet.

Agaricus plinthogalus Otto, Versuch. Agar. 75. 1816.

Agaricus fuliginosus Fries, Syst. Myc. 1: 73. 1821.

Lactaria fuliginosa Fries, Epicr. Myc. 348. 1838.

Lactaria fumosa Peck, Ann. Rep. N. Y. State Mus. 24: 74. 1872.

Lactariella azonites (Bull.) Schröt. in Cohn, Krypt.-Fl. Schles. 3: 544. 1889.

HABITAT: In deciduous or mixed woods.

DISTRIBUTION: Maine, Vermont, New York, Pennsylvania, North Carolina, and Alabama.

37. *LACTARIA LIGNIOTA* Fries, Monogr. 2: 177. 1863*Lactaria fuliginosa major* Fries, Epicr. 348. 1838.*Lactariella ligniota* Schröt. in Cohn, Krypt.-Fl. Schles. 3: 544. 1889.

HABITAT: On the ground in mossy wet woods, especially under fir trees.

DISTRIBUTION: New York, Vermont, Connecticut, New Jersey, and North Carolina.

38. *LACTARIA GERARDII* Peck, Ann. Rep. N. Y. State

Mus. 26: 65. 1874

HABITAT: On the ground in woods or groves.

DISTRIBUTION: New York, Vermont, Pennsylvania, District of Columbia, and North Carolina.

39. *LACTARIA SALMONEA* Peck, Bull. Torrey

Club 25: 369. 1898

HABITAT: In wet swampy places, usually on bare ground that has been overflowed.

DISTRIBUTION: Alabama and Mississippi.

40. *LACTARIA LACTIFLUA* (L.) Burl. Mem. Torrey

Club 14: 90. 1908

Agaricus lactifluus L. Sp. Pl. 1172. 1753.*Agaricus oedematopus* Scop. Fl. Carn. 2: 453. 1772.*Agaricus testaceus* Alb. & Schw. Consp. Fung. 209. 1805.*Agaricus volemus* Fries, Syst. Myc. I.: 69. 1821.*Lactaria volema* Fries, Epicr. Myc. 344. 1838.

HABITAT: In woods or groves, especially in the vicinity of oaks.

DISTRIBUTION: Eastern United States from Maine to Alabama and Mississippi, and west to Indiana and Missouri.

41. *LACTARIA HYGROPHOROIDES* Berk. & Curt. Ann.

Mag. Nat. Hist. III. 4: 10. 1859

Lactaria distans Peck, Ann. Rep. N. Y. State Mus. 23: 117. 1873.

HABITAT: Mixed woods.

DISTRIBUTION: From Maine to District of Columbia, and in Mississippi, Missouri, and Indiana.

42. LACTARIA CORRUGIS Peck, Ann. Rep. N. Y. State
Mus. 32: 31. 1880

HABITAT: Moist woods, especially in mixed oak-chestnut-maple woods.

DISTRIBUTION: From New York south to Alabama and Mississippi, and west to Tennessee and Missouri.

43. LACTARIA CAMPHORATA (Bull.) Fries, Epicr.
Myc. 346. 1838

Agaricus camphoratus Bull. Herb. Fr. pl. 567, f. 1. 1791. Hist. Champ. 493. 1809.

HABITAT: Most abundant in moist mixed woods.

DISTRIBUTION: From New York and Vermont south to Alabama and Tennessee.

44. LACTARIA RIMOSELLA Peck, Bull. N. Y. State
Mus. 105: 37. 1906

HABITAT: In mixed woods, under beech trees, also on bare soil in woods or by roadsides.

DISTRIBUTION: New York and Vermont.

45. LACTARIA SUBDULCIS (Pers.) Fries, Epicr.
Myc. 345. 1838

Agaricus lactifluus dulcis Bull. Herb. Fr. pl. 224, A, B. 1784.

Agaricus subdulcis Pers. Syn. Meth. Fung. 433, 434. 1801.

Lactaria subseriflua Longy. Rep. Mich. Ac. Sci. 1901: 57, 59. 1902.

HABITAT: In woods, or on the borders of woods.

DISTRIBUTION: From Maine south to Alabama and Missouri and west to Illinois.

46. LACTARIA ISABELLINA Burl. Bull. Torrey
Club 34: 88. 1907

HABITAT: In leaf-mold or sphagnum, in moist mixed or spruce woods.

DISTRIBUTION: Vermont and North Carolina.

47. *LACTARIA PARVA* Peck, Ann. Rep. N. Y. State
Mus. 29: 44. 1878

HABITAT: On the ground or on decaying wood in moist woods.

DISTRIBUTION: New York, Vermont, and Toronto, Canada.

48. *LACTARIA VARIA* Peck, Ann. Rep. N. Y. State
Mus. 38: 126. 1885

HABITAT: On the ground in moist woods.

DISTRIBUTION: New York, Vermont, Massachusetts, and New Jersey.

49. *LACTARIA CHELIDONIUM* Peck, Ann. Rep. N. Y.
State Mus. 24: 74. 1872

HABITAT: In sandy dry soil under pine or spruce trees.

DISTRIBUTION: New York, Vermont, Connecticut, North Carolina, and Alabama.

50. *LACTARIA RUSTICANA* (Scop.) Burl. Mem. Torrey
Club 14: 27. 1908

HABITAT: In open grassy places in woods.

DISTRIBUTION: New York, Vermont, Ohio, and Maryland.

367 CLIFTON PLACE,
BROOKLYN, N. Y.

A NEW COLOR GUIDE

P. L. RICKER

Several years ago the writer was appointed on a committee with Dr. W. A. Murrill and the late Dr. L. M. Underwood, by the American Mycological Society (now united with the Botanical Society of America) to prepare a color guide adequate to the needs of botanists and mycologists. After working on it for about two years the writer learned of a similar work in preparation by Dr. Robert Ridgway, the well-known ornithologist and author of a *Nomenclature of Colors* (1886) which contains 186 colors, shades and tints. After a consultation with Dr. Ridgway, and later with the other members of the committee, it was decided to leave the field of color work in favor of Dr. Ridgway. The writer is now glad to announce that Dr. Ridgway has been particularly fortunate in securing competent publishers who state that the work will probably be ready in about six months. The chemist of the firm is an expert in colors and has, in fact, been engaged at odd times for several years in preparing for a similar work. Dr. Ridgway has been at the revision of his old work as his time would permit for about twenty years, and it is safe to say that no similar work has ever been prepared with the same degree of physical and mathematical precision. This will be better understood by those familiar with Michelson's interferometer (an instrument by which it is possible to measure the wave-lengths of all light colors in millionths of a millimeter, a millimeter being $\frac{1}{25}$ of an inch), when it is stated that each primary and secondary color in this work is a composite resulting from the measurement in wave-lengths of light of each color as represented in nine standard works upon the subject, the measurements being made by Prof. P. G. Nutting, of the U. S. Bureau of Standards.

The work will contain 64 plates, each with 27 blocks of color, in three rows of nine blocks each, or a total of about 1,350 blocks, the blocks being one-half by one inch, as in his first color work.

These will be named as far as possible, it being manifestly impossible to satisfactorily name all of them, and in addition each horizontal row will be numbered and the vertical rows lettered, intermediate figures and letters between each row being used to represent intermediate shades or tints when that degree of accuracy is necessary. Instead of the degree of variation between blocks of color in various parts of the work being very unequal, as in all previous color guides of any size, the intermediate shades, tints and hues are determined by a uniform scale of percentages by the use of Maxwell's color wheel. There will be a probable edition of 2,500 copies, the volumes being about five and a half by eight inches, and one inch thick. For field use it is expected about 800 of these copies will have their margin trimmed and be bound in a flexible leather binding, easily fitting a man's coat pocket. The price with board covers will be about \$5.00. The only work extant which approaches this in any respect is the *Repertoire de Couleurs* of the Société Française des Chrysanthémistes, containing 1,385 color shades and tints, of which only about 365 are named, and no method is provided for designating the others. It consists of two bulky volumes of loose plates in portfolios, many of the intermediate shades, tints and hues are too nearly alike, and a prohibitive import duty brings the price in this country to about \$10.00. The paper is also too heavy, and its form is entirely unsuited for field work.

BUREAU OF PLANT INDUSTRY,
WASHINGTON, D. C.

NEWS AND NOTES

Yale University has received from Mrs. Morris K. Jesup \$100,000 to establish the Morris K. Jesup chair of agriculture in the Forestry School.

Georgia has appropriated \$10,000 for educational work at farmers' institutes in the state.

A new agricultural college and research institute has been opened at Coimbatore in British India.

Benjamin F. Lutman (A.B. Missouri, 1906; Ph.D. Wisconsin, 1909), recently assistant in botany in the University of Wisconsin, has accepted a position as assistant botanist in the Vermont Experiment Station.

Dr. W. A. Murrill sailed for Mexico on December 2, to continue his studies of tropical American fungi. He was accompanied by Mrs. Murrill.

The new College of Agriculture of the University of the Philippines, opened last June with a registration of about sixty. E. B. Copeland is dean and professor of botany; H. Cuzner is professor of agronomy.

The University of Wisconsin has created a new department of plant pathology, and has appointed as professor in charge Dr. Lewis Ralph Jones, of the University of Vermont. Professor Jones has been botanist of the Vermont Experiment Station since 1890. During this period he has carried on research work in the bureau of plant industry in Washington, and in Europe. In

addition to gaining a high reputation as a teacher, he has occupied a field of wide service in Vermont in developing the work of the Vermont Botanical Club and the state forestry department, in securing for the University the Pringle Herbarium with Dr. Pringle as curator, and recently in organizing a new department of teaching. As a public-spirited citizen and as an instructor, he holds a secure position in the esteem and affection of the students and the people of the state. Professor Jones will remain in Burlington until January, and enter on the work of his new appointment at the beginning of the second semester.

In the *Botanical Gazette* for October, 1909, G. F. Atkinson describes and copiously illustrates a remarkable species of *Amanita* from California, collected and photographed by Mrs. V. G. Ballen. The name assigned, *A. calypetroderma*, refers to the fact that the calyptra of the volva fits like a skin over the center of the pileus.

A very helpful guide to Saccardo's "Sylloge Fungorum" has recently appeared under the title "Genera of Fungi," by Dr. F. E. Clements, published by the H. W. Wilson Co., Minneapolis, Minnesota. This work includes keys to the genera and larger groups found in Saccardo's work and also covers Rehm's "Discomyceten" and the lichens of Engler and Prantl's "Pflanzenfamilien."

A number of woody fungi collected by Professor S. Kusano in Formosa were recently sent in for determination and have been added to the Garden herbarium. The collection contains few novelties, most of the species having been received before, either from the Philippines or from Japan.

A description list of the hymenomycetes found in the vicinity of Chicago, by Dr. W. S. Moffatt, has recently been published as Bulletin no. 7, part 1, of the Natural History Survey of The Chicago Academy of Sciences. The pamphlet contains 156 pages

of text and 24 plates. It not only lists the known species of the region, but also brings together in compact form descriptive notes on these species that have been scattered through many publications. Students and collectors in almost any region of the northern United States would find it helpful on this account.

Mr. H. C. Beardslee, of Asheville, North Carolina, contributes the following notes on *Boletus rubinellus* Peck:

"This species occurs quite regularly at Asheville, though always sparingly, and has been kept under observation for several years. As found here it is a very attractive little plant, answering well to Peck's description except that the spores are a little smaller than the dimensions given by him. In my plant, they measure $9-10 \times 4 \mu$. It seems to be clearly distinct from *B. piperatus*, to which it has little resemblance, and distinct enough from *B. communis*. The question that I would raise concerning it is that of its relationship to *B. rubinus* Smith.

"The description given of Smith's plant does not apply in all points to our *Boletus*. *B. rubinus* is placed with the Subtomentosi, but this will surprise no one who has collected our plant. It has all the marks of that section and if collected in dry weather would be confidently referred to it, although it is viscid in wet weather. The spores of *B. rubinus* are said to be oval, almost round, $6 \times 5 \mu$. This is not true of the American plant, but other points in the description strongly suggest it. Mr. Rea has kindly examined my specimens and photographs and is of the opinion that it is the same as Smith's species. It would seem that a careful comparison of these species should be made, especially with reference to their microscopic features. Personally, I do not believe the two species are distinct."

Several new species of gill-fungi and three new species of coral-fungi are described by Professor G. F. Atkinson in *Annales Mycologici* for August, 1909.

The thirteenth annual fungus foray of the British Mycological Society was held at Baslow, Derbyshire, England, from Septem-

ber 27 to October 2, 1909. The members collected during each day and met for the discussion of interesting specimens and the reading of papers in the evenings.

The fourth annual report of the Forest Park Reservation Commission of New Jersey, published in September, 1909, includes an illustrated article of twenty-four pages on the planting and care of shade trees, by Alfred Gaskill, forester; one of sixteen pages on insects injurious to shade trees, by John B. Smith, state entomologist; and one of twenty pages on the fungi of native and shade trees, by Byron D. Halsted, botanist of the State Experiment Station. These three articles probably constitute the most comprehensive and helpful publication on the care of American shade trees to be obtained anywhere.

Arrangements are being made to hold the first meeting of the American Phytopathological Society in connection with the American Association for the Advancement of Science at Boston, Massachusetts, during Convocation Week, December 27, 1909, to January 1, 1910, at which time questions relating to the future policy of the Society and its relations to Section G of the American Association for the Advancement of Science will be definitely determined.

The biology of *Armillaria mucida* Schrad. is the subject of a paper by C. E. C. Fischer in the *Annals of Botany* for October, 1909. The fungus was artificially grown from spores, and several fruitless attempts were made to introduce it as a parasite into the beech tree, on which the sporophores are commonly found. Owners of beech forests are advised by the author to keep wounds on their trees covered with an antiseptic, and to destroy dead infected timber and young sporophores before they are able to shed spores.

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